

What IS CLAIMED IS:

1. A display device comprising:

a display panel having cathodes, gates, and anodes in which said cathodes and said gates are connected in a matrix manner;

an electron emitter which may emit electrons in a state where a voltage is applied only between said cathodes and said anodes and which is provided with said cathode;

in which display of each of pixels is performed under a dark state by stopping electron emission from said electron emitter for said anodes by applying a stop voltage between said cathodes and said gates, and

a control means which controls operation of a circuit for driving a display panel in such a way that a potential of each of said anodes becomes not less than a threshold value potential by which said potential of each of anodes can perform electron emission from said electron emitter after a predetermined time elapse from starting of application of a drive voltage which may provide a specified display state or said stop voltage between said cathodes and said gates when a display starting signal is generated.

2. The display device according to claim 1,

wherein application of said stop voltage between said cathode and said gate and said drive voltage which may provide said specified display state is performed for all the pixels of said display panel at the same time.

3. The display device according to claim 1, wherein a scanning selective potential is supplied to at least one line scanning wiring, a scanning non-selective potential is supplied to the remaining scanning wirings, a predetermined potential which generates the darkest state for each pixel is supplied to all the columns of said display panel in synchronization with supply of said scanning selective potential or a predetermined modulation potential is supplied.

whereby said stop voltage or said drive voltage which may provide said specified state is applied between said cathodes and gates.

4. The display device according to claim 1, wherein said display panel drive circuit has:

an anode power supply circuit for supplying said anode potential;

a cathode drive circuit for driving said cathodes;

a gate drive circuit for driving said gate; and

a drive power supply circuit for supplying a driving reference voltage for generating a drive

voltage which may provide said stop voltage or said specified state to said cathode drive circuit and said gate drive circuit.

5. The display device according to claim 4, wherein said drive power supply circuit starts supplying said driving reference potential under a state where a drive potential for a logic circuit to said cathode drive circuit and said gate drive circuit, supply of said driving reference potential starts, and thereafter said cathode drive circuit and said gate drive circuit start application of said stop voltage or said driving voltage which may provide said specified display state.

6. The display device according to claim 4, wherein a terminal when application of said stop voltage or said driving voltage which may provide said specified display state,

said anode power supply circuit holds said anode so as to have a specified potential sufficiently lower than said threshold value potential which may emit electrons from said electron emitter under a state where a drive potential for a logic circuit is supplied to said anode power supply circuit.

7. The display device according to claim 4,

wherein after application of said stop voltage or said drive voltage which may provide said specified display state starts, application of drive voltage is permitted based on input display image data from said cathode drive circuit and said gate drive circuit to said display panel.

8. The display device according to claim 1, wherein after said voltage between cathodes and gates is transited from an unstable state to zero, application of said stop voltage and said drive voltage which may provide said specified display state starts.

9. The display device according to claim 1, wherein any one of first and second supply steps is performed,

said first step of supplying scanning non-selective potential which may apply said stop voltage irrespective of a potential of the other wiring to any one of cathode wirings and gate wirings which are defined by scanning wirings of said display panel; and

said second step of supplying a modulation potential which may apply a drive voltage that provides said specified display state or said stop voltage irrespective of a potential of the other wiring defined by said scanning wirings to any one of cathode wirings and gate wirings which are defined by modulation signal

wirings;

whereby said stop voltage or said drive voltage which may provide said specified display state is applied between said cathodes and gates.

10. The display device according to claim 1, wherein a modulation potential to be supplied to any one of said cathode wiring and said gate wiring which are defined by modulation signal wirings of said display panel is a potential selected from three or more levels, and potentials at two or more levels from among them are potentials which generate a drive voltage which may emit electrons by allowing said two or more level potentials to be supplied in synchronization with said scanning selective potential, and one of them is a potential which generates said stop voltage.

11. The display device according to claim 1, wherein said electrical emitter is a fibrous constitutional body made of semiconductor or conductor or a nano constitutional body whose main content is carbon.

12. The display device according to claim 11, wherein said nano constitutional body includes at least one kind selected from carbon nanotube, graphite

nanofiber, amorphous carbon, carbon nanohorn, graphite, diamond like carbon, diamond and fullerene.

13. A drive control method for a display device having a display panel having cathodes, gates, and anodes in which said cathodes and said gates are connected in a matrix manner; and an electron emitter which may emit electrons in a state where a voltage is applied only between said cathodes and said anodes and which is provided with said cathode; in which display of each of pixels is performed under a dark state by stopping electron emission from said electron emitter for said anodes by applying a stop voltage between said cathodes and said gates,

said method comprising:

a application step of applying said stop voltage or a drive voltage which may provide a specified display state between said cathodes and said gates when a display starting signal is generated; and

an anode voltage supplying step of allowing a potential of said anode not to be less than a threshold value potential which may emit electrons from said electron emitter after a predetermined time elapse from starting of said application step.

14. The drive control method for the drive device according to claim 13; wherein

a driving power supply circuit starts supplying a driving reference potential for generating said stop voltage or a drive voltage which may provide said specified display state to said cathode drive circuit and said gate drive circuit under a state where a drive potential for a logic circuit is supplied to a cathode drive circuit and a gate drive circuit;

thereafter, said application step starts, and at a starting time of said application step, an anode power supply circuit holds said anode at a specified voltage which is sufficiently lower than a threshold voltage which may perform electron emission from said electron emitter under a state where said drive potential for said logic circuit is supplied to said anode power supply circuit; and

further thereafter, said anode potential supplying step starts, said anode is held at a voltage which is sufficiently higher than said threshold potential which may perform electron emission from said electron emitter, and application of said drive voltage for display is permitted based on a display image input to said display panel from said cathode drive circuit and said gate drive circuit.